

(12) UK Patent Application (19) GB (11) 2 286 567 (13) A

(43) Date of A Publication 23.08.1995

(21) Application No 9402263.9

(22) Date of Filing 05.02.1994

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(51) INT CL⁶

B62B 3/10, B60K 1/00, B60L 15/04

(52) UK CL (Edition N)

B7H HC H728 H741 H755 H760

(56) Documents Cited

EP 0523277 A1 FR 002604662 A1

(58) Field of Search

UK CL (Edition M) B7H HC HDM HDP HDR HDS HDV
INT CL⁵ B60K 1/00, B62B 3/10
Online database: WPI

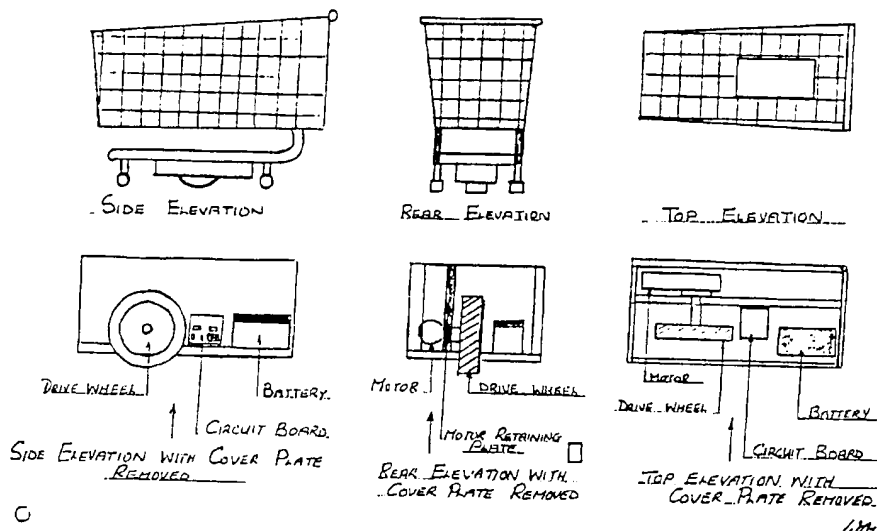
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(54) Motorised drive unit for fitting to a trolley

(57) The drive unit, consisting of a motor, battery and control circuitry, is fitted to the trolley in addition to its existing running wheels to assist users who are handicapped, elderly or infirm. The motor is started by a push-button which may have a delayed action to avoid startling the user. The trolley stops as soon as the push-button is released. The unit is small, self-contained and lightweight and may be fitted to trolleys eg for use in shopping, for luggage, at railway stations, at airports or in kitchens.

MQBI - TROL FIGS



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Fig 1

DELAYED SOFT START

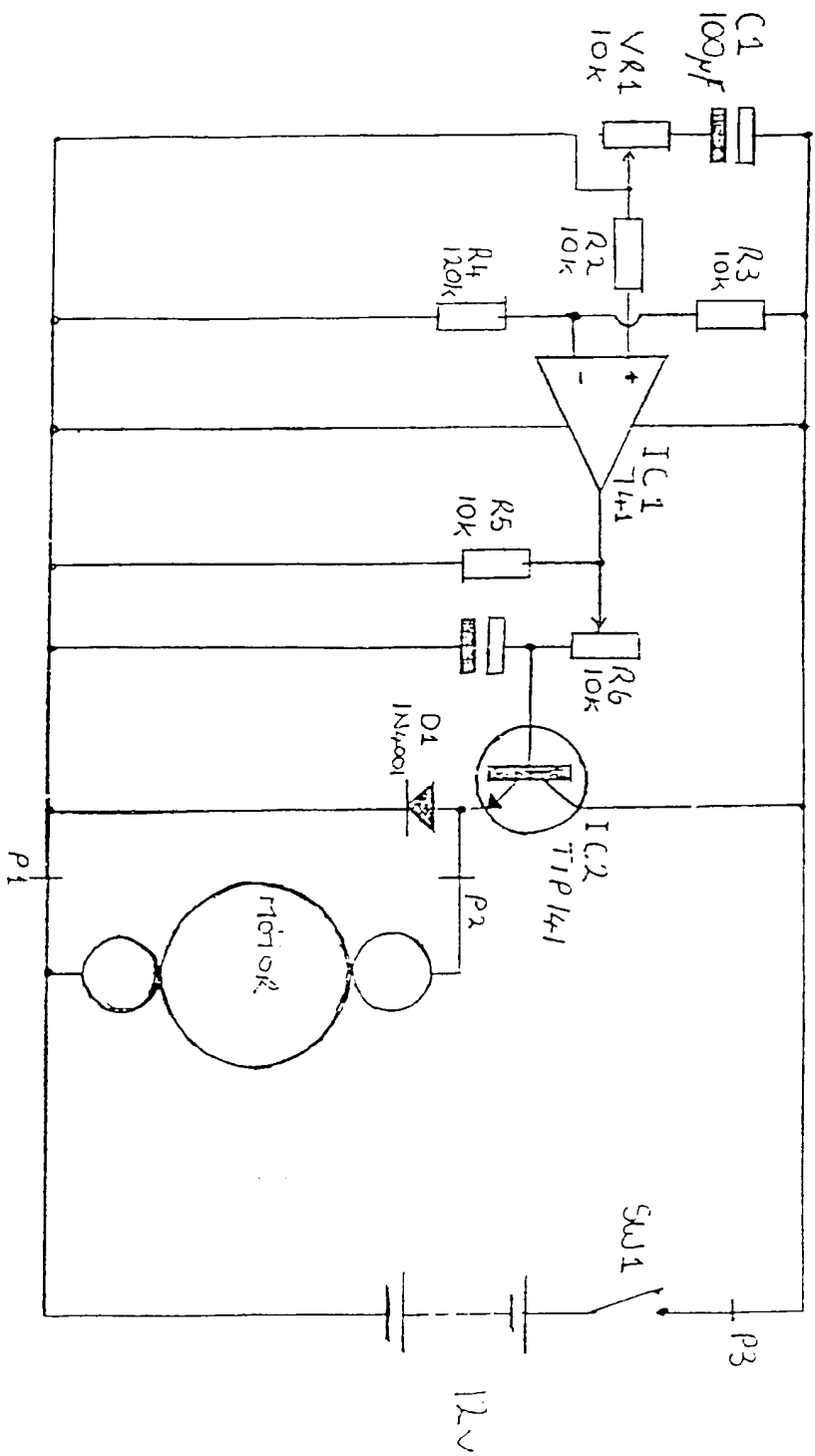
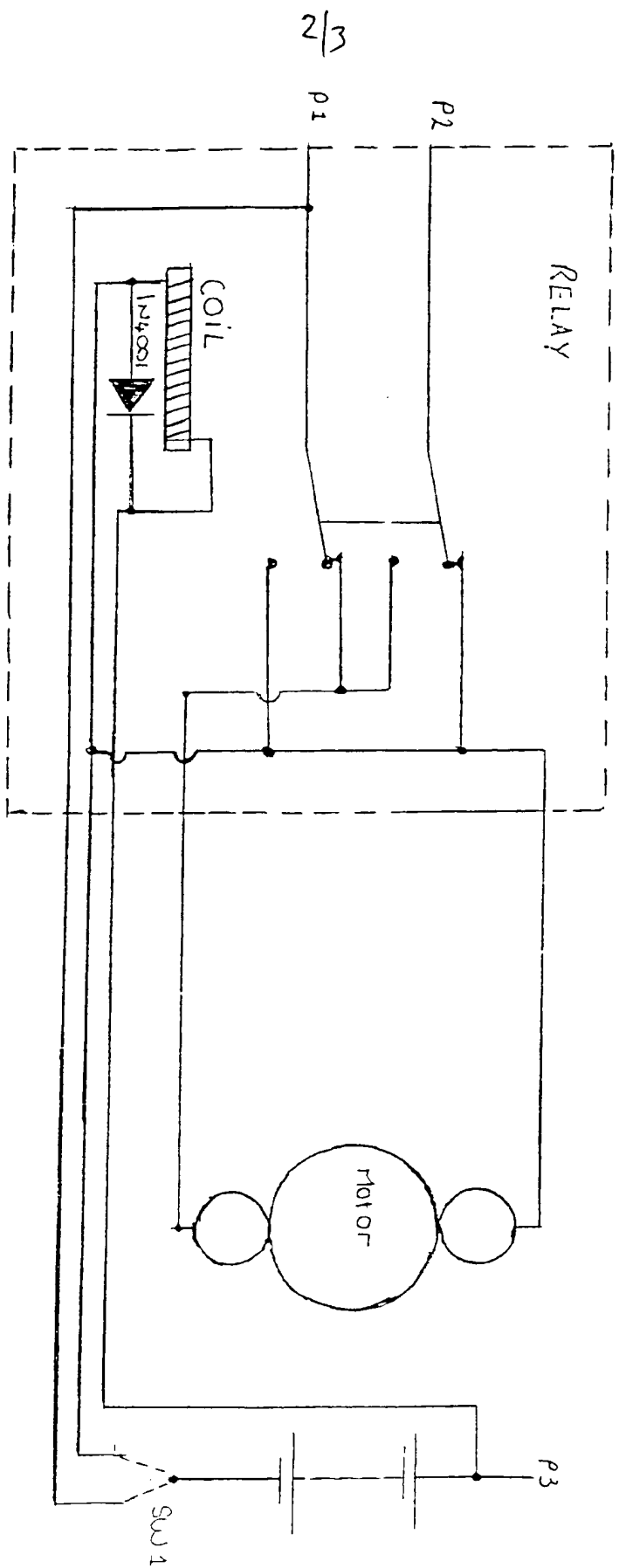


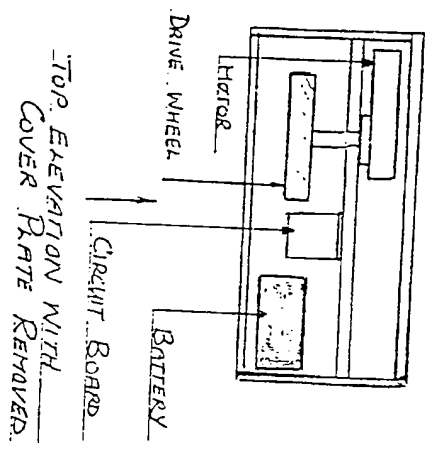
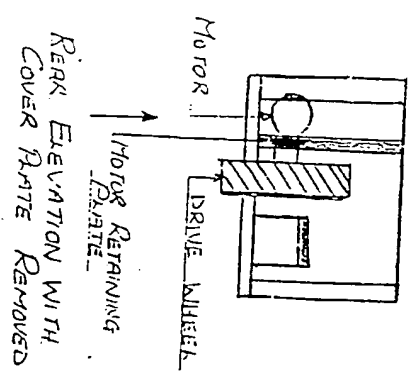
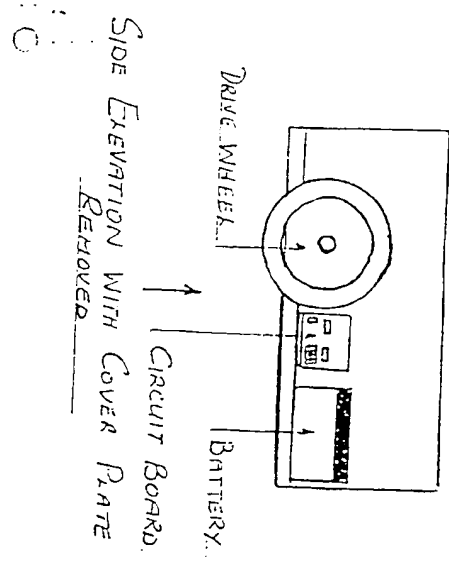
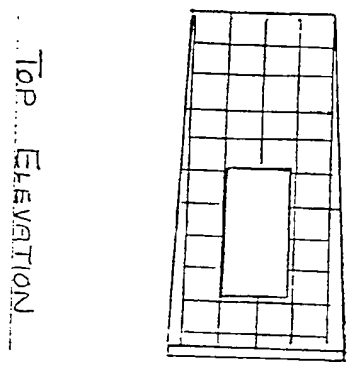
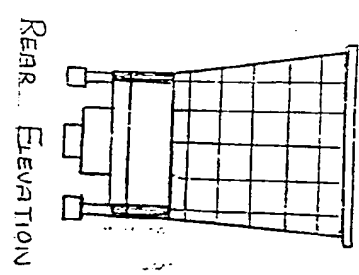
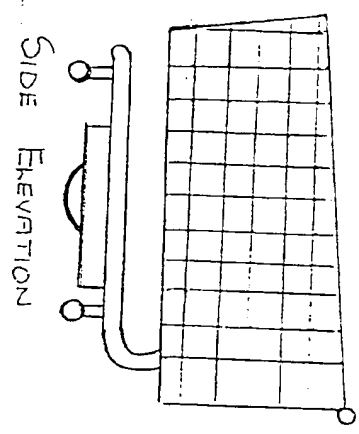
Fig 2

Reversing Switch.



MOBI - TROL

FIG. 3



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TROLLEY MOBILISATION UNIT

This invention relates to a motorised Shopping Trolley - " **The Mobi-troll** " Driving Unit.

Large superstores use various types of trolley based on different designs and sizes. A large number of the customers are either fully-fit or wheelchair bound. The present-day trolleys offer little mobility when fully or half-laden with goods. The directional drive can be awkward and inflexible, the main problem being the initial motion push effort required.

Quite often, damaged wheels cause delays and problems in movement and steering. These problems are difficult enough for fully-mobile fit people and especially for young parents with children. This invention is aimed to cater for the needs of a specific and significant sector of the market, which has not yet had its requirements satisfactorily met - we are talking of the 'mobile' handicapped, elderly and infirm. People with ailments such as arthritic hip, leg injuries or defective joints.

Young mothers or fathers with permanent deformities such as 'club foot' would also be included in the potential sector which would benefit from the implementation of this invention.

People recovering from recent minor operations would also feel the benefit of such a product.

By adding a motor-driven extra wheel (see Diagram No.3) the initial problem of movement is overcome; wired to an electrical circuit, which also serves as a timer-delay system (see Diagram No.1) a few seconds delay occurs after the micro-switch has been pressed which has been installed so as not to startle potential users such as the elderly.

The four existing wheels act as a stabilisation structure and steering unit and with the motor, battery and circuitry mounted on a support angle bracket (see Diagram No.3), health and safety aspects are covered in the context of regulation and commerciality.

The trolley proto-type has been tested and will transport a load of 12 stones at a speed in the region of 2 miles per hour.

The movement stops as soon as the micro-switch is released which prevents any undue travel and possible contact with other customers or goods.

Electric Circuit

The CCT shown forms the Motor Control Diver Unit.

The characteristics of this circuit are;

- 1 To give a delay of approximately 2 seconds and
- 2 To softstart the motor.

C₁ is charged by the time determined by VR₁. When a voltage is reached (determined by R₃ & R₄), the output of the Op Amp (IC₁) is turned on.

This action starts to charge up C₂ by a time determined by VR₆.

This gradually turns on the Transistor (IC₂) and starts the motor slowly.

D₁ is to prevent back E.M.F.'s and thus creates protection for the CCT.

SW₁ ensures that the motor stops in a short as possible distance and resets the system to start again when the SW₁ is depressed.

Because of the simplicity of this CCT, as can be seen from Fig 2, a reverse mechanism can be easily incorporated into it.

Key:-

CCT	=	Circuit
C ₁	=	Capacitor 1
VR	=	Variable Resistor
IC ₁	=	Intergrated Circuit (Op Amp)
IC ₂	=	TIP 141 (Transistor)
R ₃	=	Resistor 3
R ₄	=	Resistor 4
R ₅	=	Resistor 5
R ₆	=	Resistor 6

CLAIMS

- 1 The " Mobi-Troll " Driving Unit can be easily fitted to existing trolleys (see Diagram No.)
- 2 The people wishing to use them could pay a small deposit which is redeemed on return of the trolley and connected " Mobi-Troll ". This would ensure also that the " Mobi-Troll " unit was being used by the appropriate market sector.
- 3 The battery will operate for a maximum of 5 hours application time which would be ample time for most major stores in terms of re-charging.
- 4 Stores using the " Mobi-Troll " could actually increase their profits with additional " Semi - handicapped " people being aware of the availability and convenience of the " Mobi-Troll "
- 5 The positioning and construction of the Drive Unit is economical and cost-effective with the added bonus of easy maintenance.
- 6 Every item of the unit can be easily replaced with a minimum of time and cost.
- 7 The " Mobi-Troll " Driving Unit can be adapted with relative ease for a wider range of applications such as : Hospital trolleys, Railway station porter trolleys, Kitchen staff trolleys and trolleys such as those used at airports for luggage transportation.

Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

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Application number
 GB 9402263.9

Relevant Technical Fields

(i) UK Cl (Ed.M) B7H (HC,HDM,HDP,HDR,HDS,HDV)

(ii) Int Cl (Ed.5) B60K 1/00, B62B 3/10

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE DATABASE : WPI

Search Examiner
 J L Twin

Date of completion of Search
 14 March 1994

Documents considered relevant
 following a search in respect of
 Claims :-
 1-7

Categories of documents

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|--|---|
| <p>X: Document indicating lack of novelty or of inventive step.</p> <p>Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p>A: Document indicating technological background and/or state of the art.</p> | <p>P: Document published on or after the declared priority date but before the filing date of the present application.</p> <p>E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.</p> <p>&: Member of the same patent family; corresponding document.</p> |
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Category	Identity of document and relevant passages	Relevant to claim(s)
X	EP 523277 A1 (LAFIS-LAGERTECHNIK FISCHER)	1 at least
X	FR 2604662 A1 (LOSEGO) see eg WPI Abstract Accession Nos 88-265900; 89-041079	1 at least

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).